



# **Armed Forces College of Medicine**

## **AFCM**



# Topography of Upper Limb

**Dr: Shereen Adel**

# INTENDED LEARNING OBJECTIVES (ILO)



By the end of this lecture the student will be able to:

1. Identify bones of shoulder girdle, arm, forearm & hand.
2. Identify different groups of muscles of pectoral region, back, arm, forearm & hand.
3. Enumerate nerves & vessels in the upper limb.

# Key points

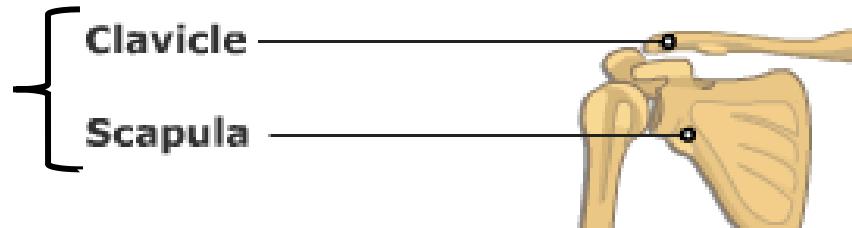


1. Bones & muscles of the upper limb.
2. Nerves & vessels of the upper limb

# Bones of Upper Limb



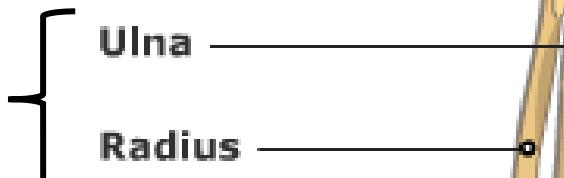
**Shoulder girdle**



**Bone of Arm**



**Bones of Forearm**

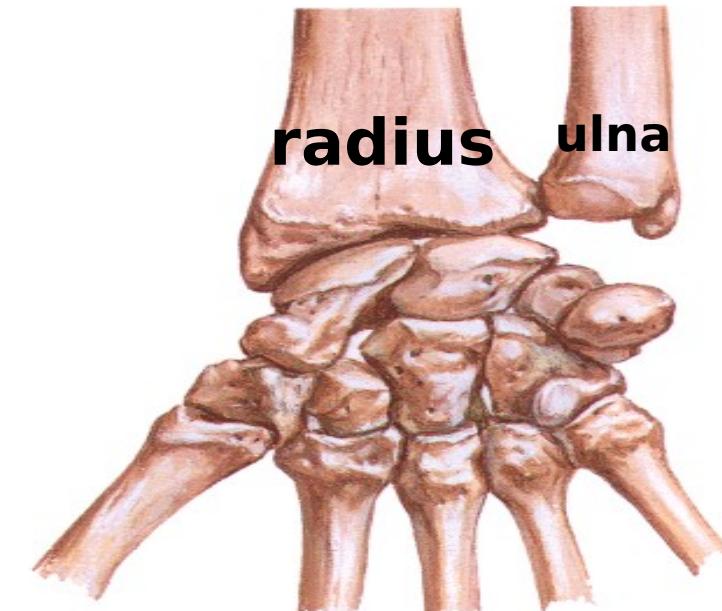


**Bones of Hand**



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q=Bones+of+upper+limb&source=lnms&tbm=isch&sa=X&ved=0ahUKEwmcq3L6mIAhX4UKHRBbAi4Q\_AUIDigB&biw=1366&bih=657#img\_rc=qMI7VvF



Frank H. Netter, 4<sup>th</sup> edition

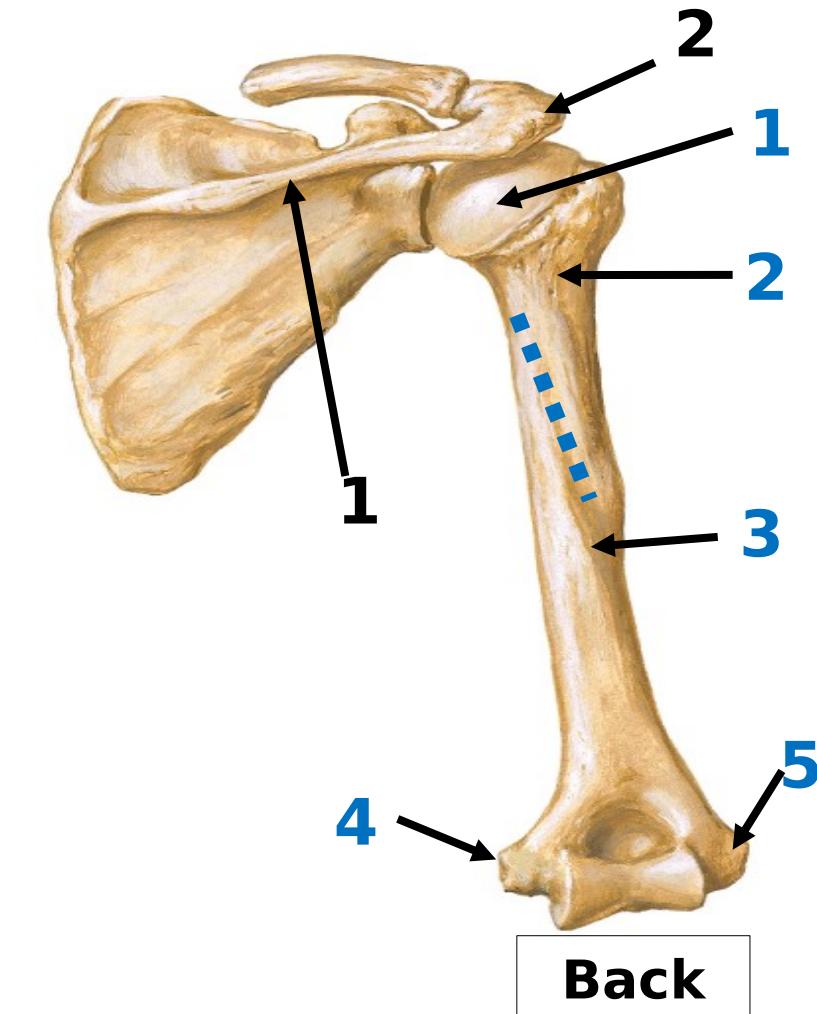
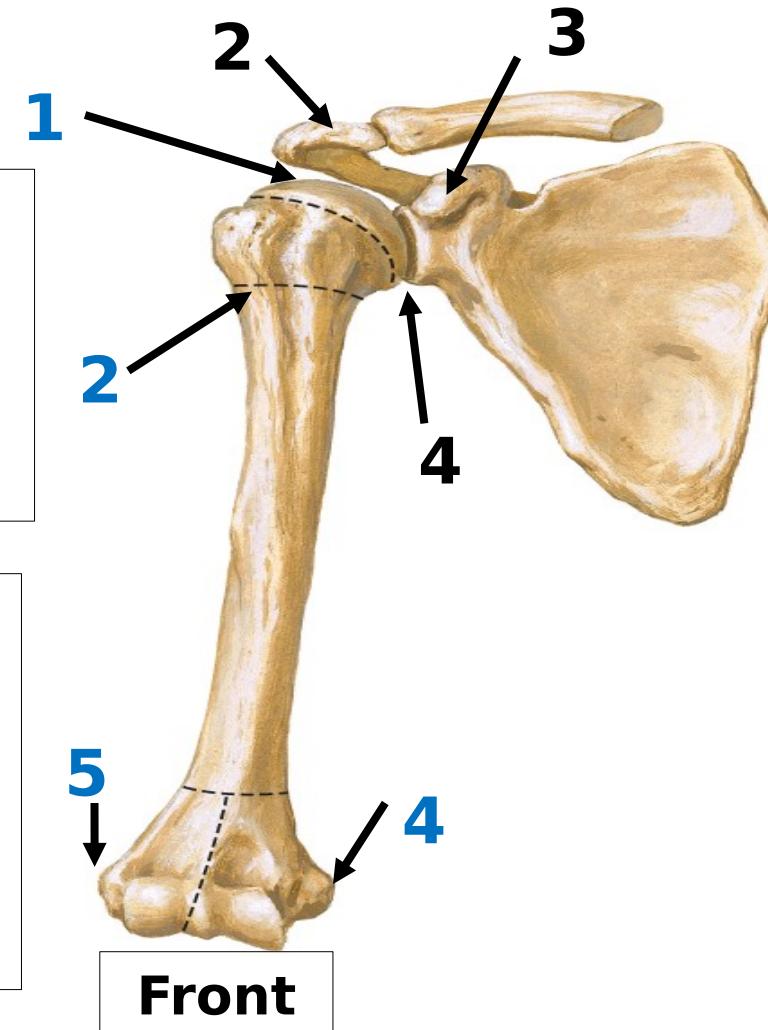
**Carpal bones  
8 in number  
arranged into 2 rows**

# Bones of Upper Limb



## Scapula:

1. Spine
2. Acromion
3. Coracoid process
4. Glenoid cavity



Frank H. Netter, 4<sup>th</sup> edition

Frank H. Netter, 4<sup>th</sup> edition

# Bones of Upper Limb

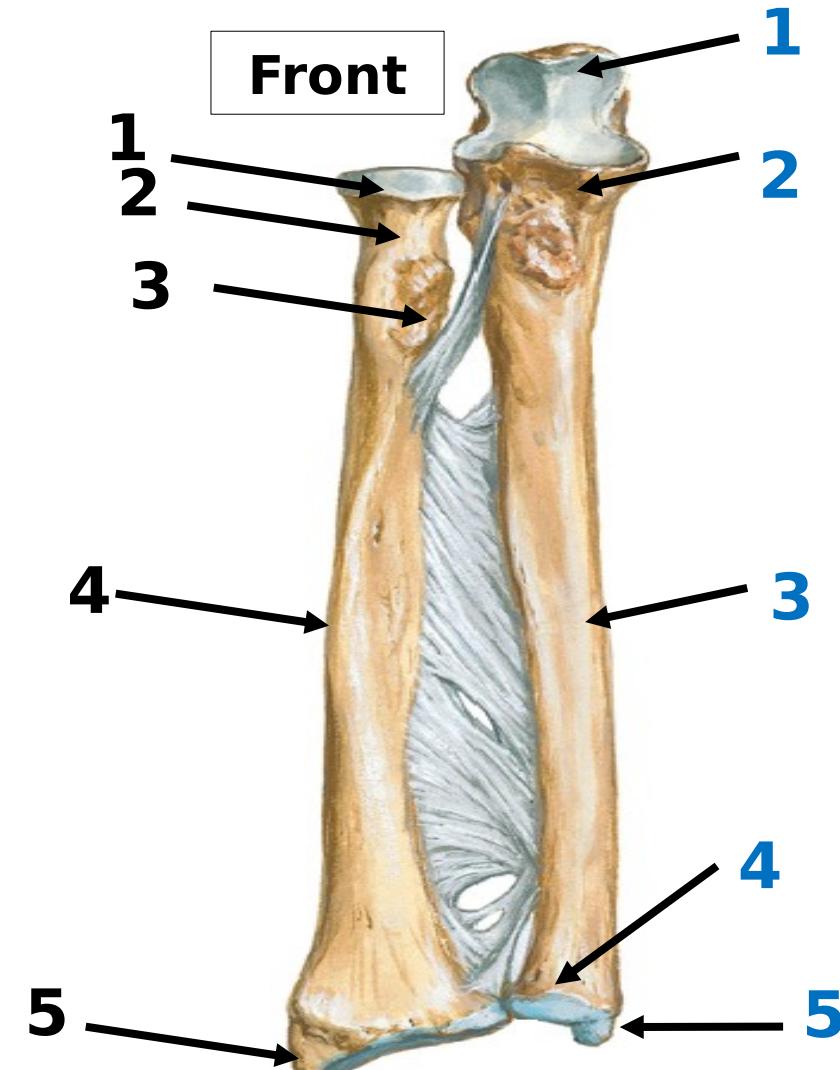


## **Radius:**

1. Head
2. Neck
3. Tuberosity
4. Shaft
5. Styloid process

## **Ulna:**

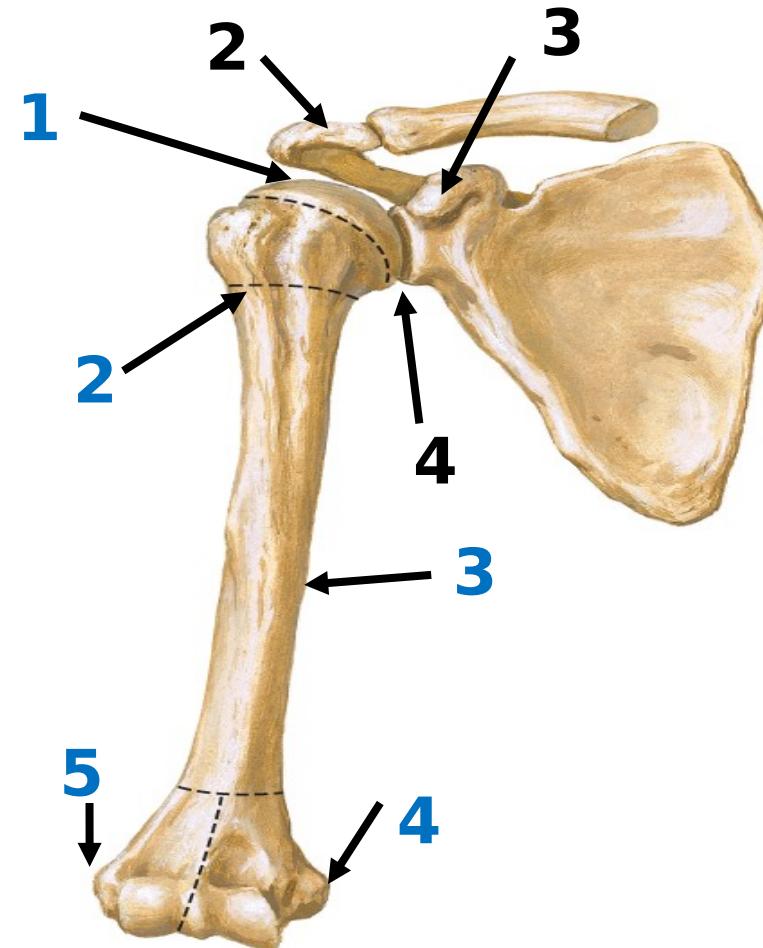
1. Olecranon
2. Coronoid process
3. Shaft
4. Head
5. Styloid process



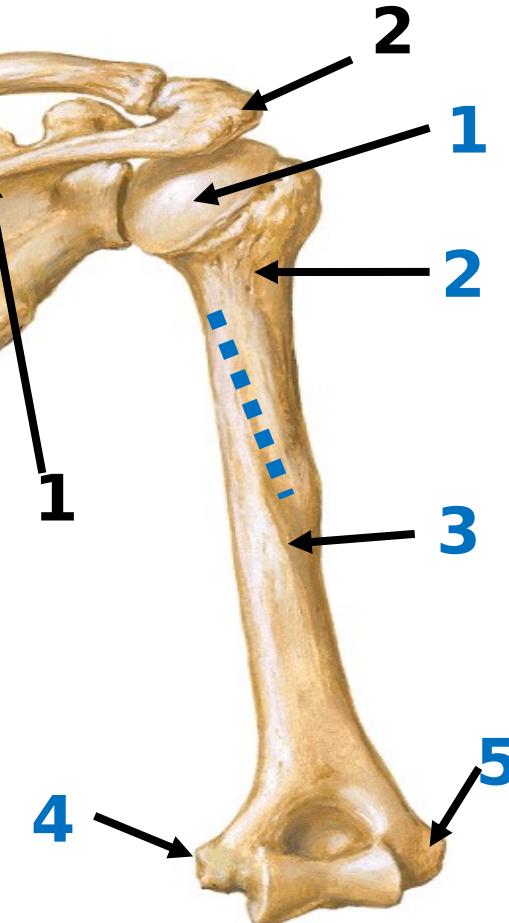
# Quiz



Identify?



Frank H. Netter, 4<sup>th</sup> edition

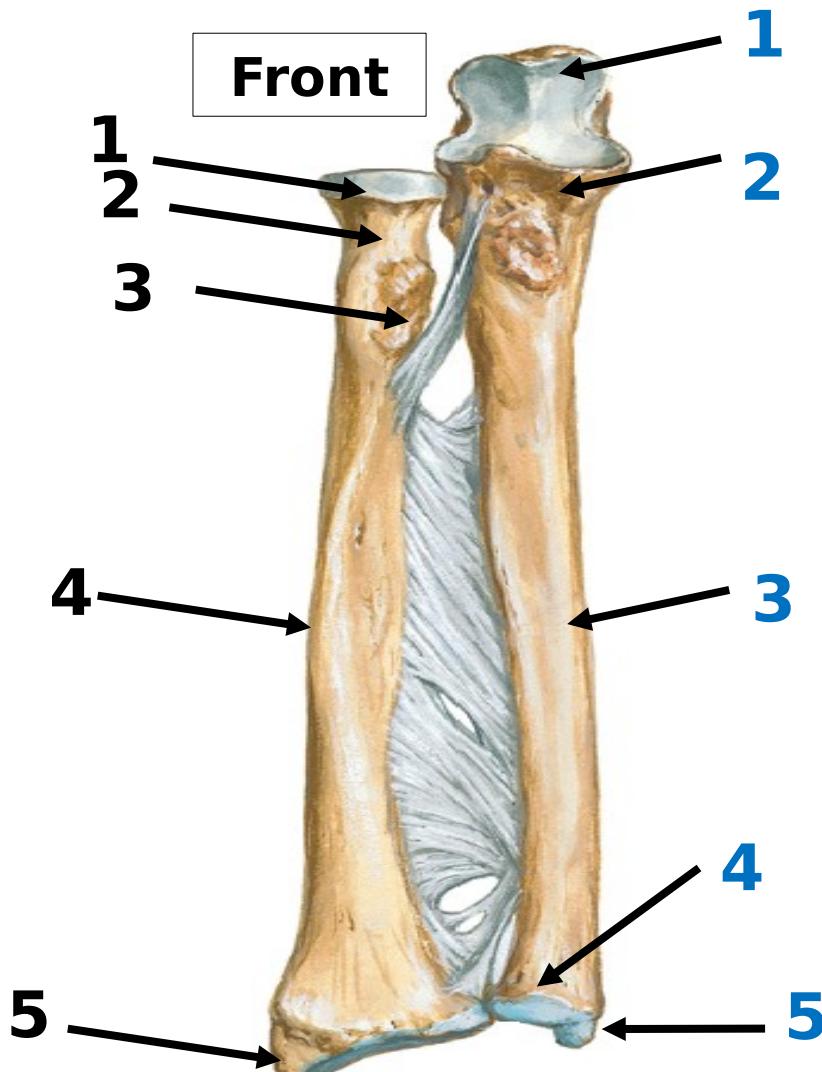


Frank H. Netter, 4<sup>th</sup> edition

# Quiz 1 (bones)



Identify?



Frank H. Netter, 4<sup>th</sup> edition

# Regions of Upper Limb

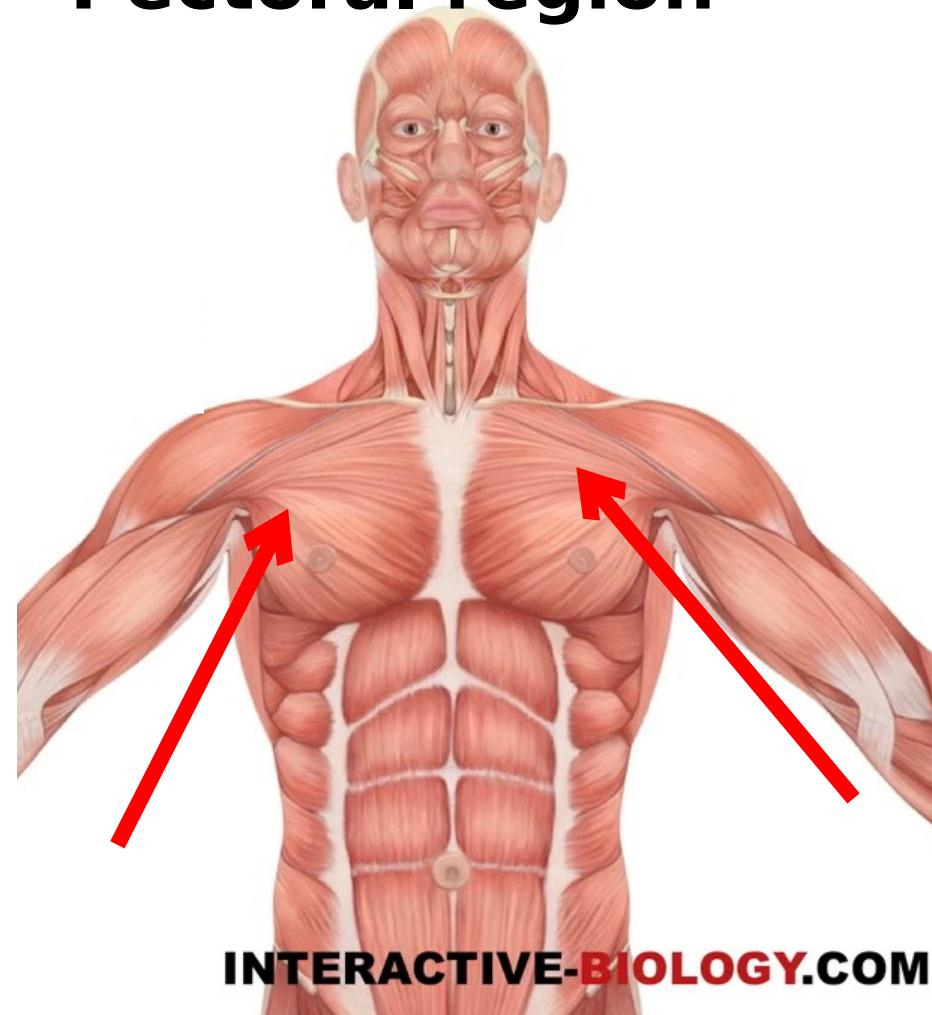


[http://www.google.com/search?  
q=upper+limb&source=lnms&tbm=isch&sa=X&ved=0ahUKEwiy\\_bvOoa\\_hA  
hVS-YUKHePWBCMO\\_AUJDgB&biw=1366&bih=657](http://www.google.com/search?q=upper+limb&source=lnms&tbm=isch&sa=X&ved=0ahUKEwiy_bvOoa_hA)  
Musculoskeletal System Module  
Musculoskeletal & Integumentary Module

# Regions of Upper Limb

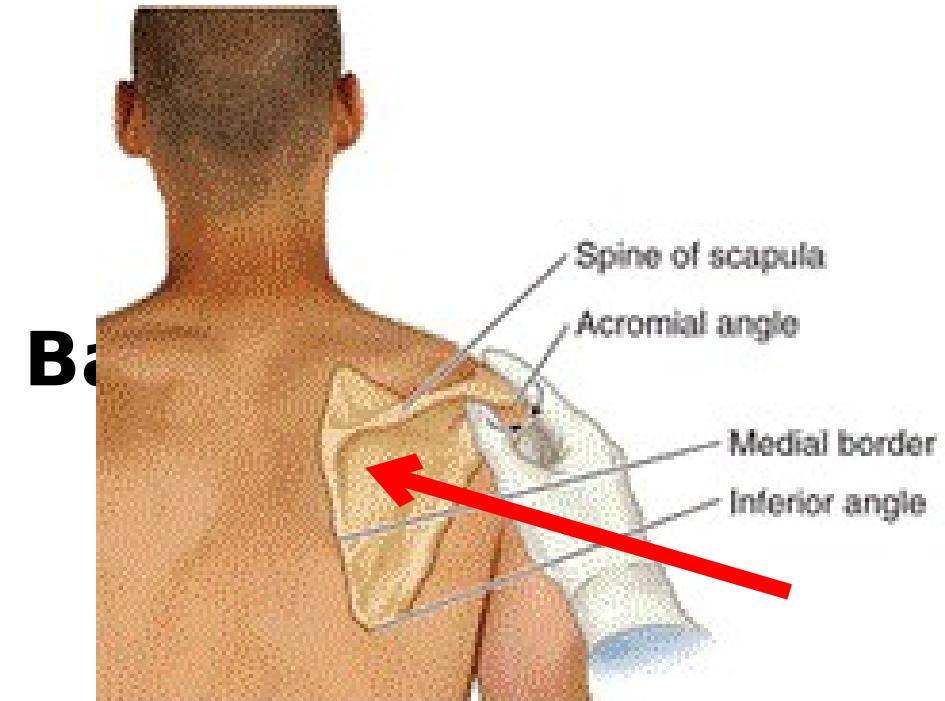


## Pectoral region



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## Back & scapular region



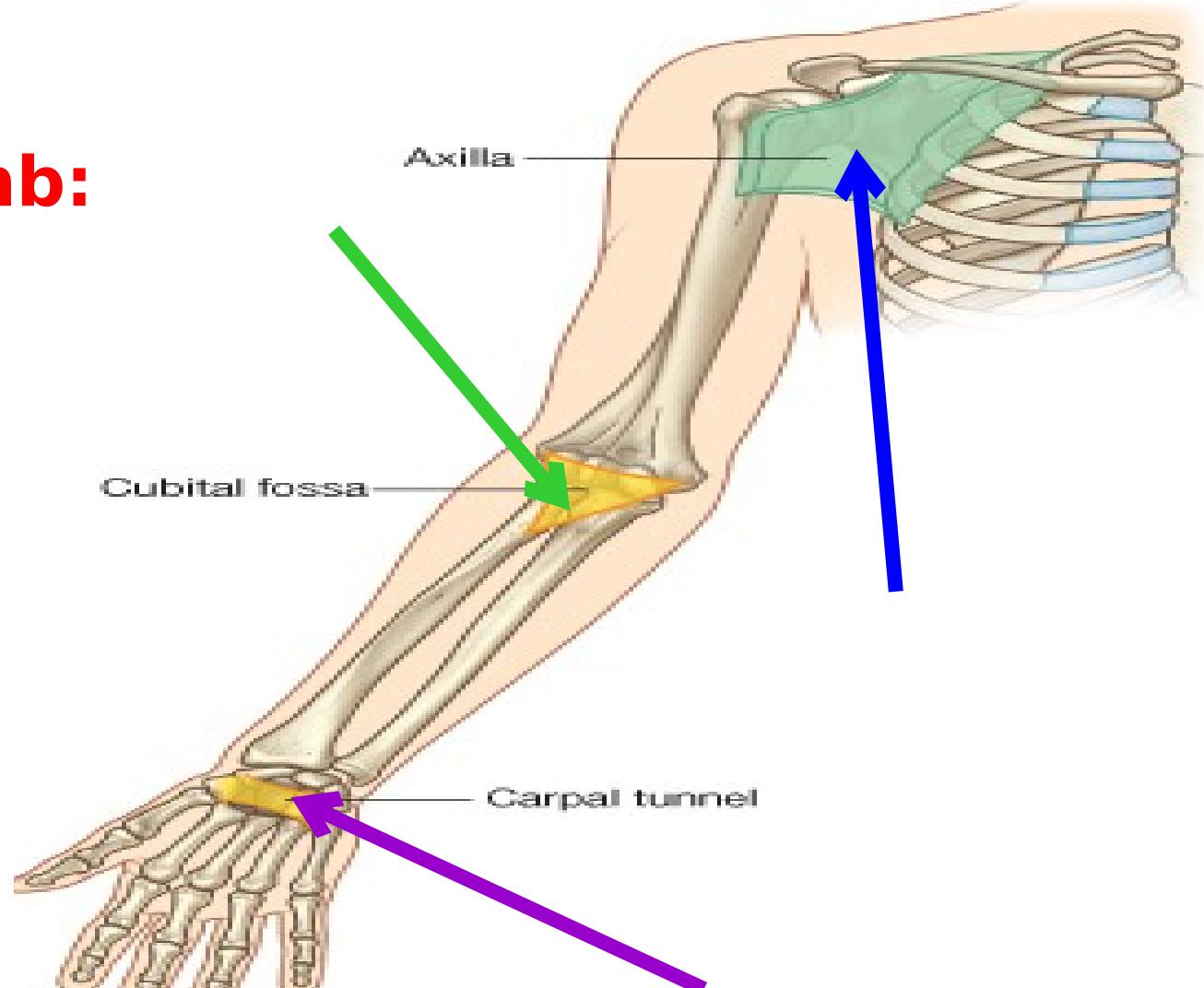
[/www.google.com/search?q=scapular+region:&source=lnms&tbm=isch&sa=X&ved=0ahUKEwjvovDn2KnhAhWOzoUKHRzgQ\\_AUDigB&biw=1366&bih=657#imgrc=lsrjj74HIFPAEM:](http://www.google.com/search?q=scapular+region:&source=lnms&tbm=isch&sa=X&ved=0ahUKEwjvovDn2KnhAhWOzoUKHRzgQ_AUDigB&biw=1366&bih=657#imgrc=lsrjj74HIFPAEM:)

# Bones & regions of Upper Limb



## Important Areas in upper limb:

- **Axilla:** arm pit
- **Cubital fossa:** in front of elbow
- **Carpal tunnel:** in front of carpal bones



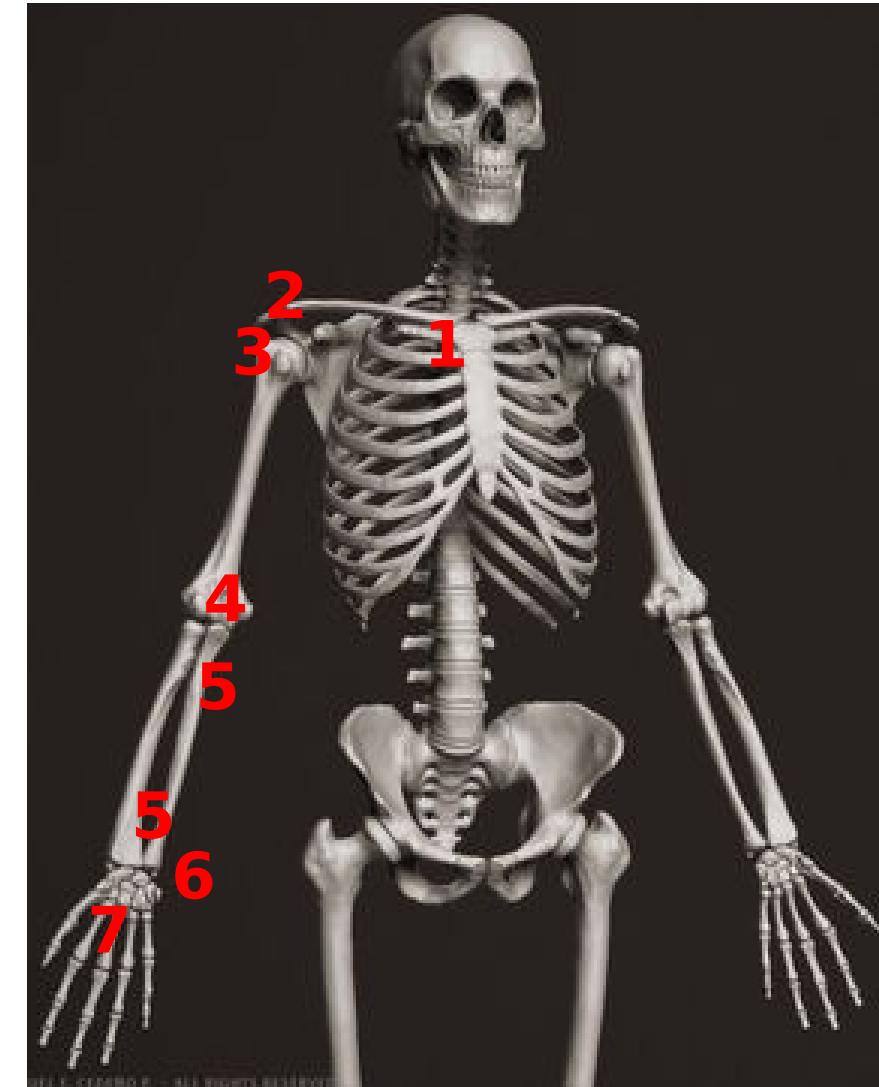
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# Joints of Upper Limb



## Joints:

1. **Sterno-clavicular joint**
  2. **Acromioclavicular**
  3. **Shoulder joint**
  4. **Elbow joint**
  5. **Superior & inferior radio-ulnar joint**
  6. **Wrist joint**
  7. **Joints of the hand**
- Shoulder  
girdle

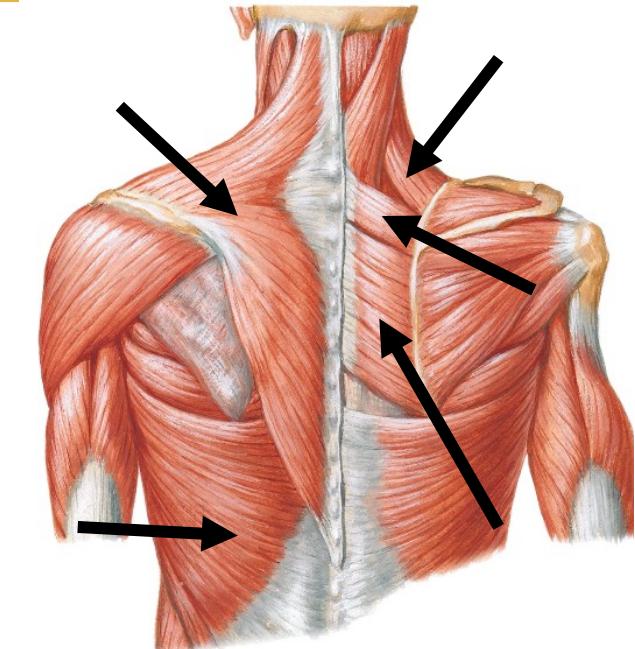


# Muscles of the Upper Limb



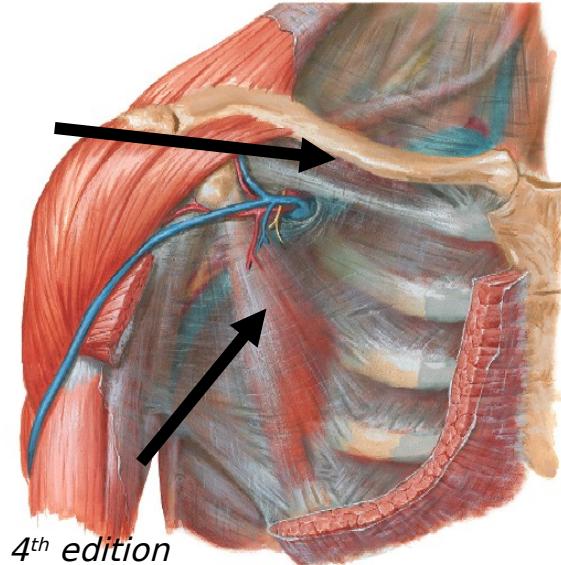
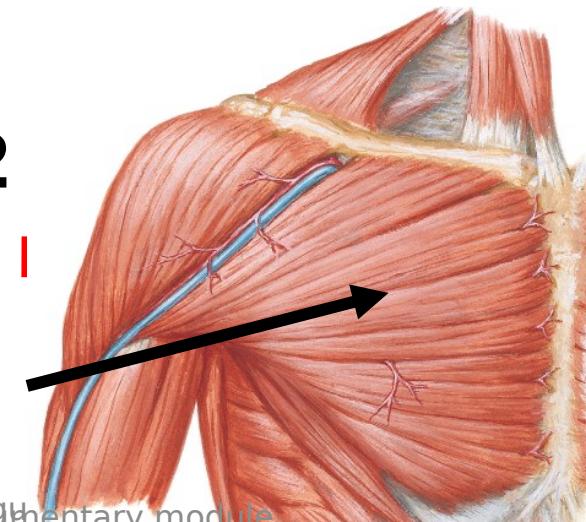
## 1. Muscles of the back (2 layers)

***Connect upper limb to vertebral column***



## 2. Muscles of pectoral region (2)

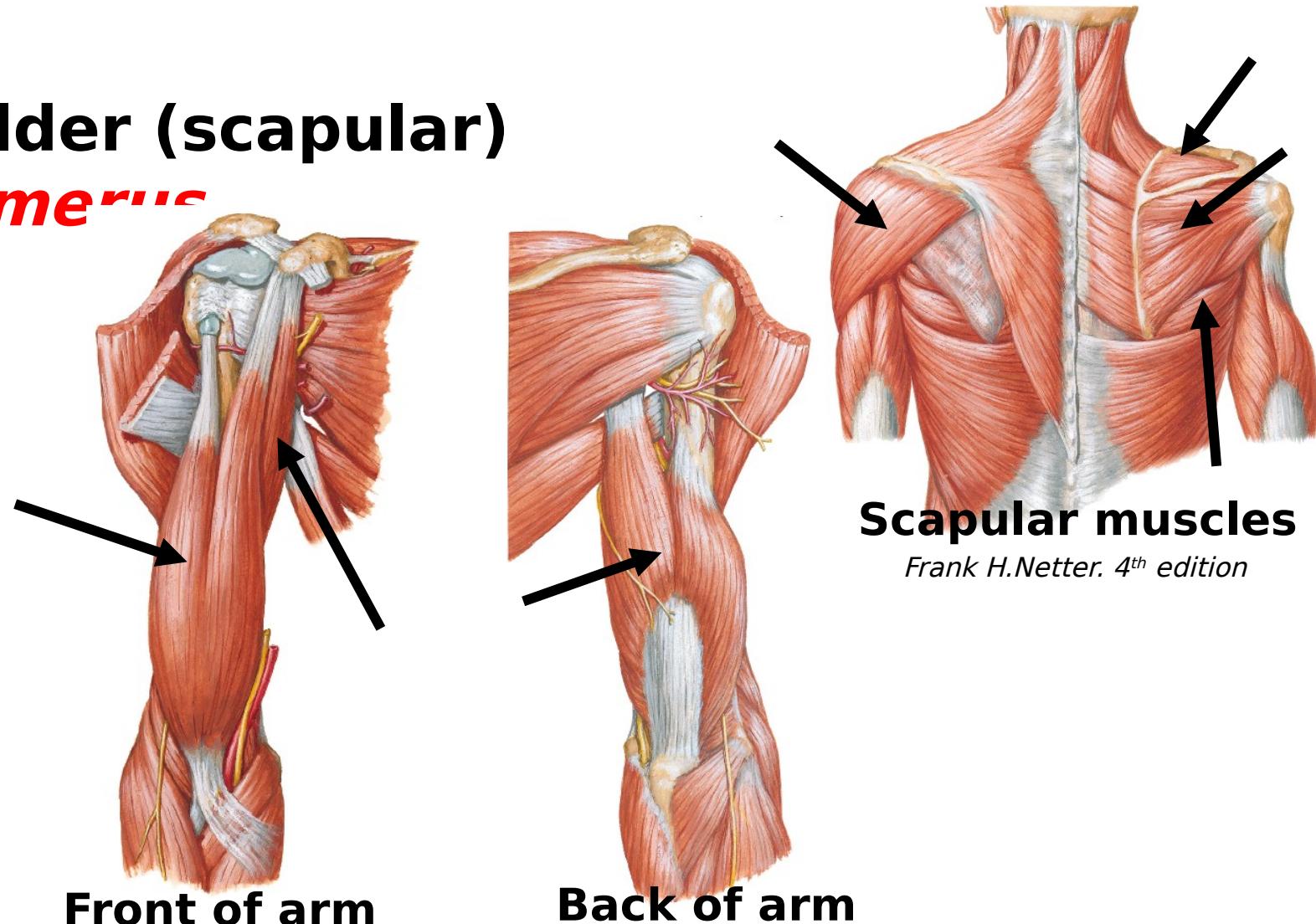
***Connect upper limb to thoracic***



# Muscles of the Upper Limb



## 3. Muscles of the shoulder (scapular) *Connect scapula to humerus*



## 4. Muscles of the arm (front & back)

# Muscles of the Upper Limb

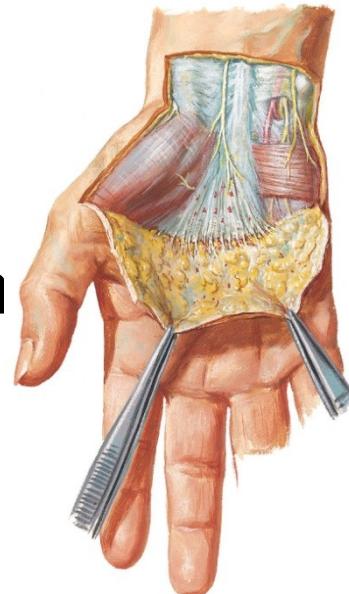


## 5. Muscles of the forearm

***Front (flexors) & back (extensors)***



## 6. Muscles of the hand

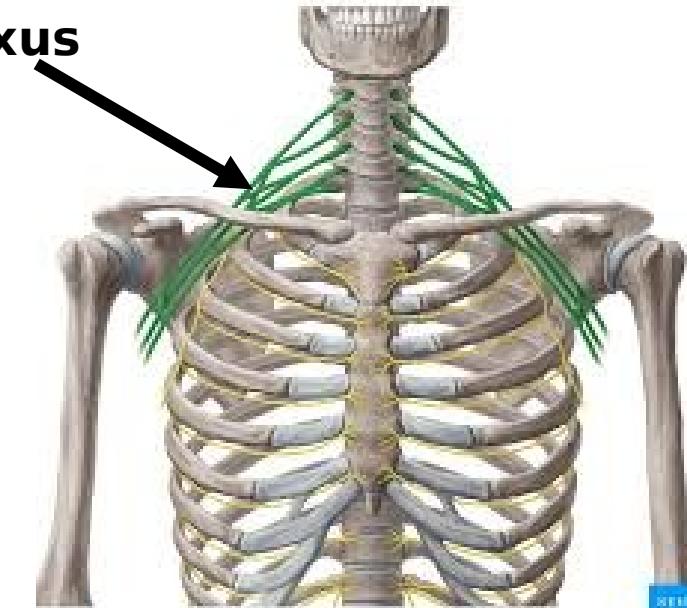
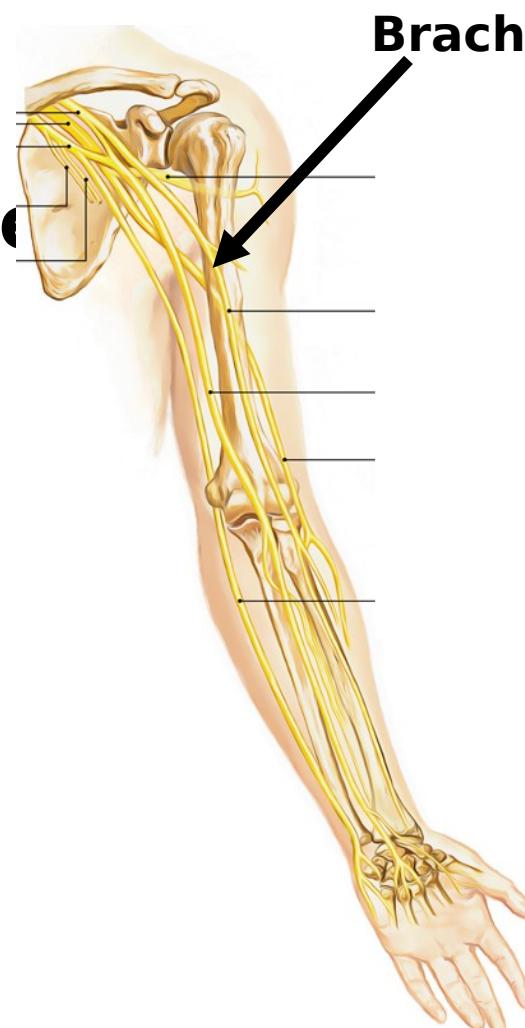


# Nerves of the Upper Limb



- **It is a plexus of nerves which passes from the neck to the axilla to enter the upper limb.**

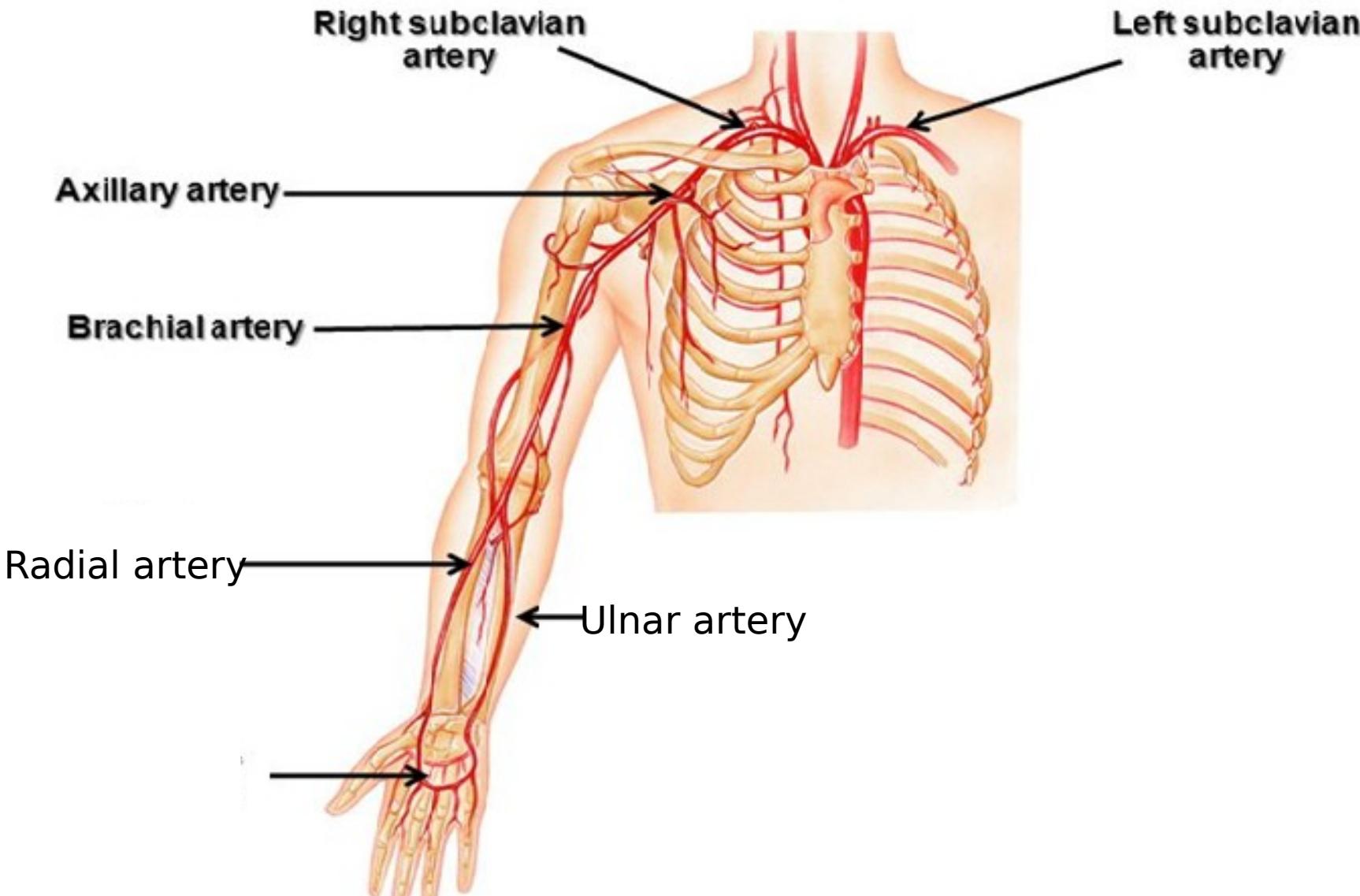
- **It supplies sensory & motor to the upper limb.**



[/www.kenhub.com/en/library/anatomy/axillary-nerve](http://www.kenhub.com/en/library/anatomy/axillary-nerve)

[www.google.com/search?  
q=brachial+plexus&source=lnms&tbo=isch&sa=X&ved=0ahUKEwj2voKgga  
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8SDotM](http://www.google.com/search?q=brachial+plexus&source=lnms&tbo=isch&sa=X&ved=0ahUKEwj2voKgga rhAhUEWhoKHRWWWDWgQ_AUfDigB&biw=1366&bih=657#imgrc=2p9p1qvd8SDotM)

# Arteries of the Upper Limb



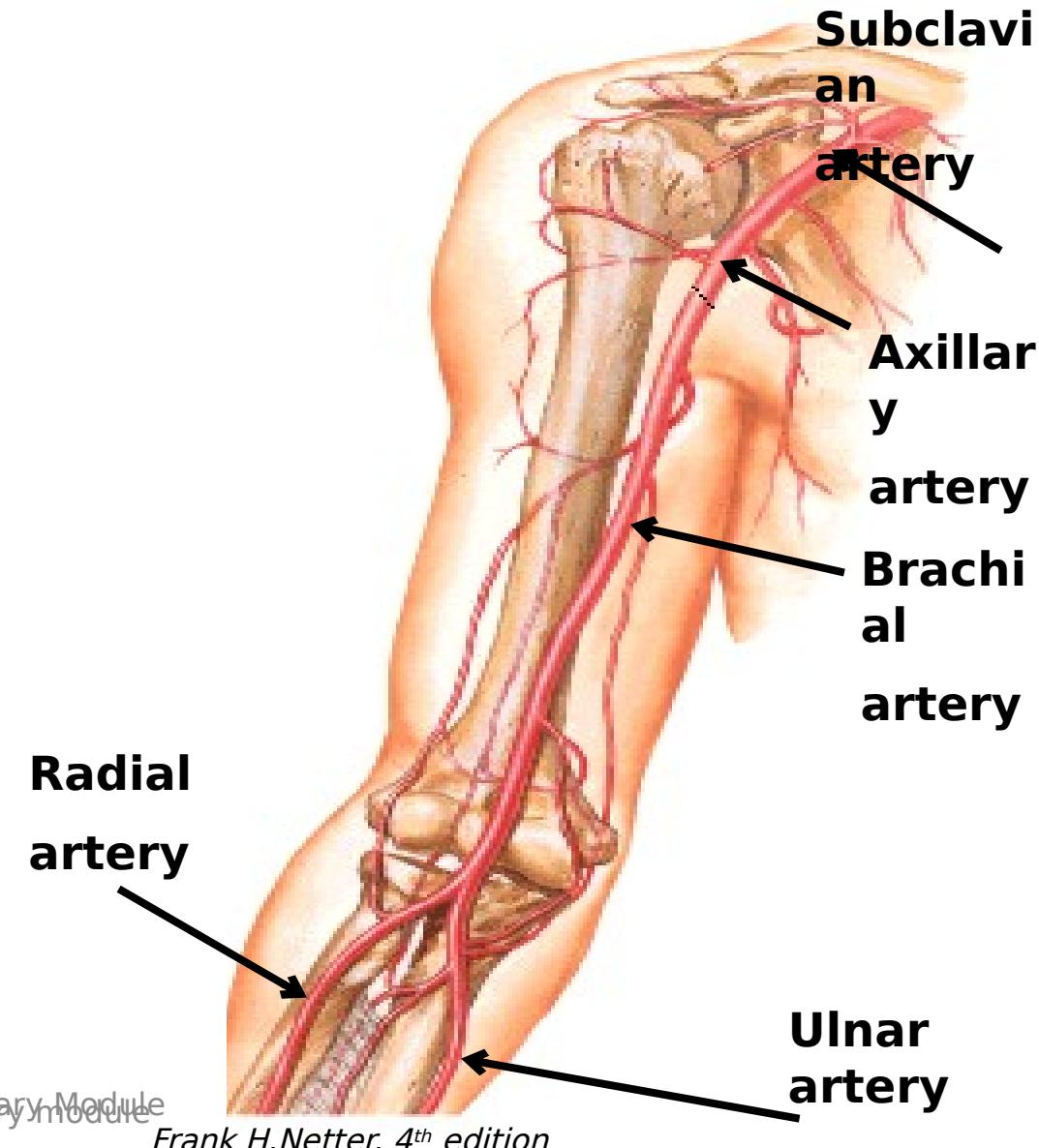
# Vessels of the Upper Limb



**Axillary artery begins as the continuation of subclavian artery at outer border of 1<sup>st</sup> rib.**

**And continue as Brachial artery at lower border of teres major.**

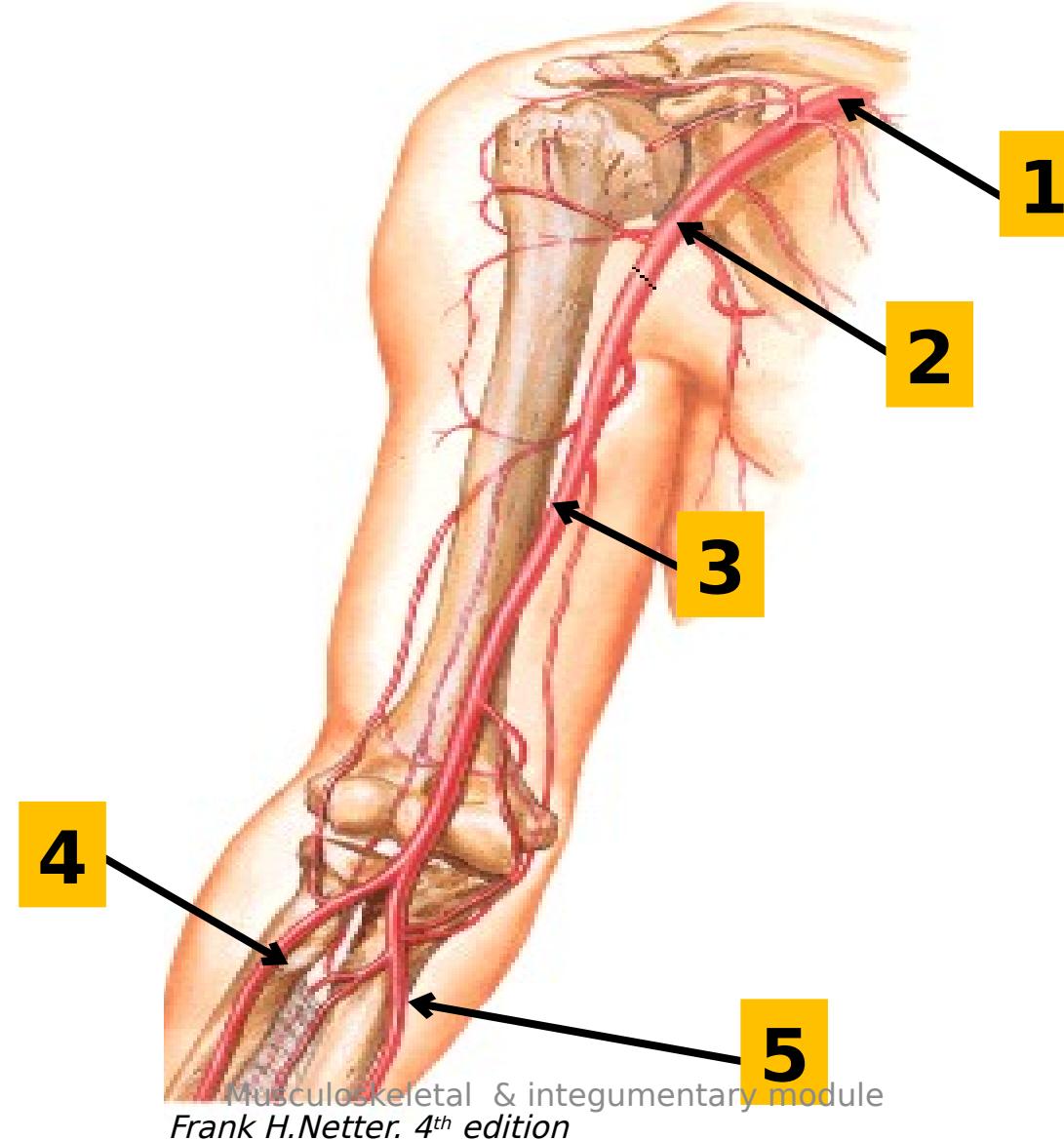
**Which ends at the level of neck of radius by dividing into radial & ulnar arteries.**



# Quiz

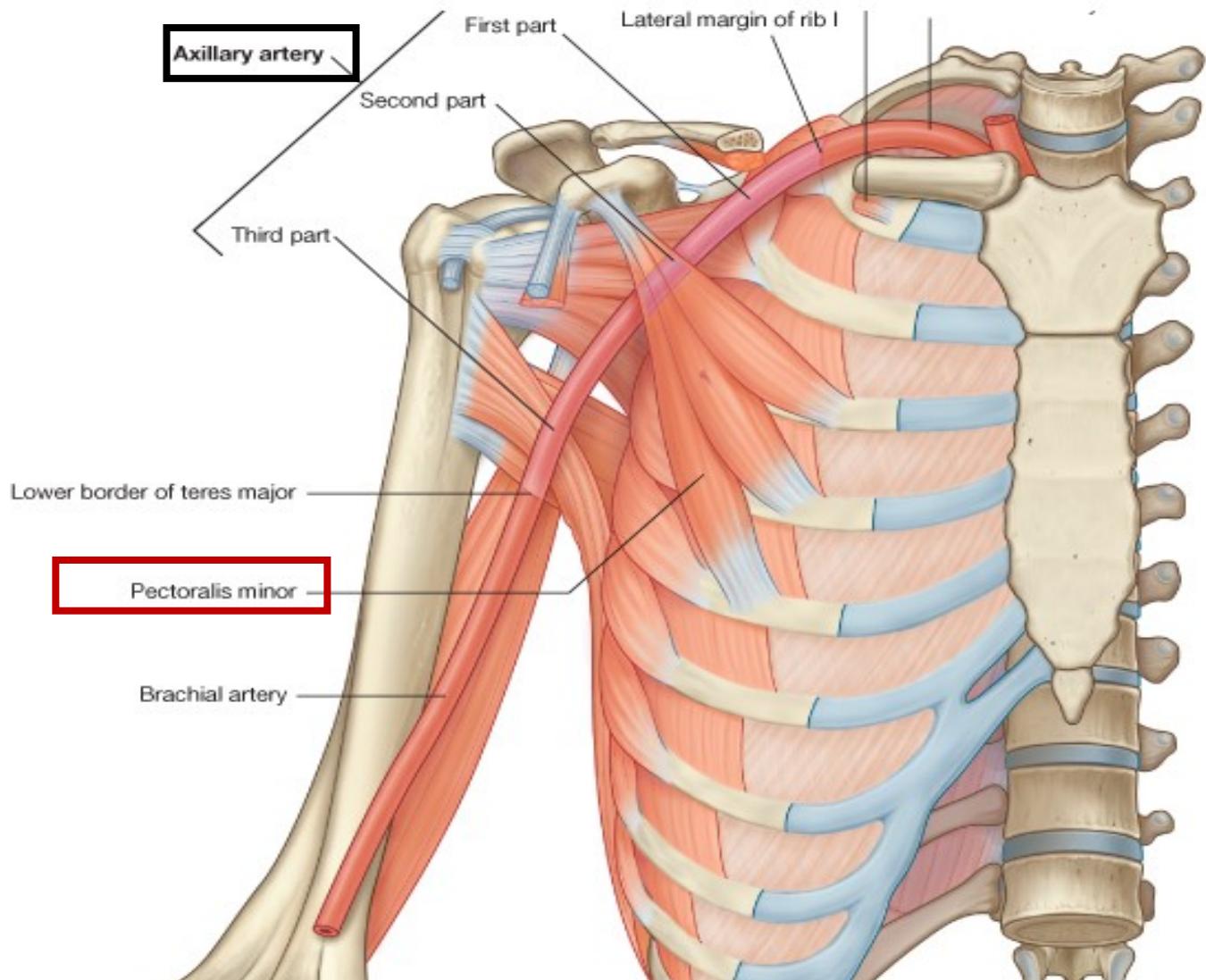


## Identify?



# Axillary artery

- The axillary artery is crossed by the **pectoralis minor** muscle
- It is divided into **three parts** according to the relation with the muscle.



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## Branches of axillary artery

:

**First part: (one branch)**  
**(superior thoracic artery)**

**Second part: (two branches)**

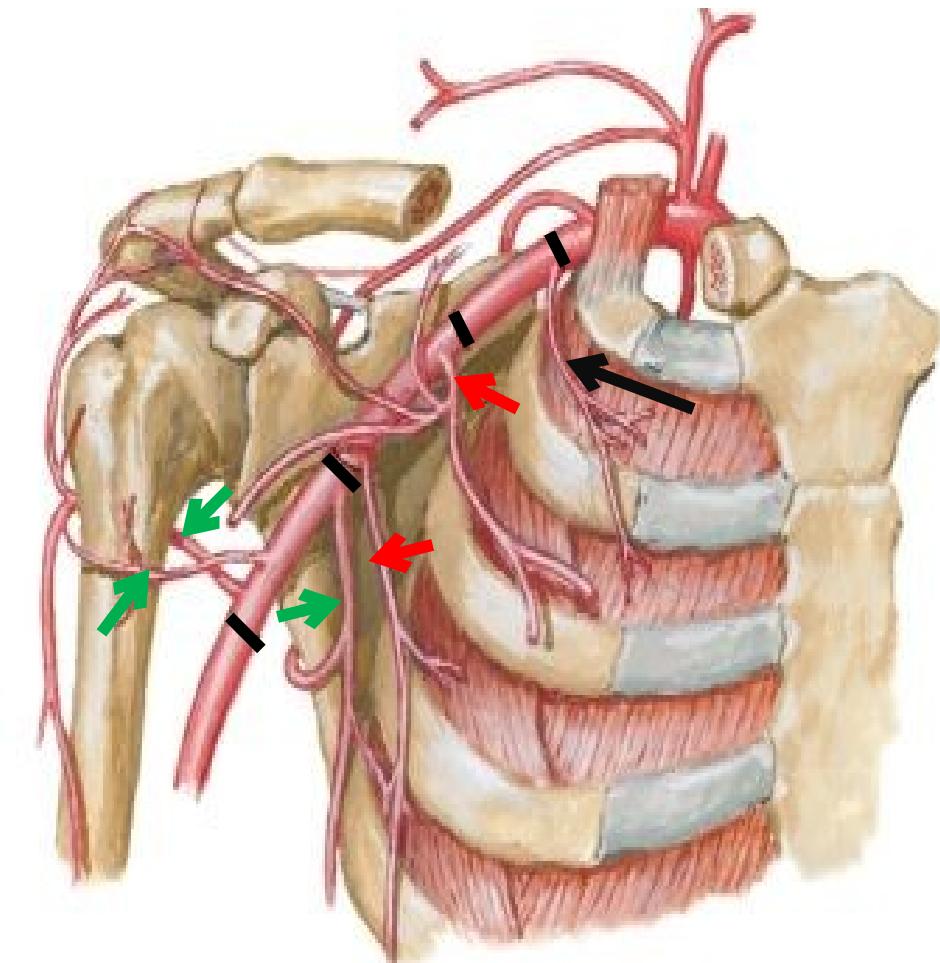
**1-Thoracoacromial artery**  
**2-Lateral thoracic artery**

**Third part ( three**  
**branches)**

**1-Subscapular**  
**artery.**

**2-Ant. Circumflex A.**

**3-Post. Circumflex A.**

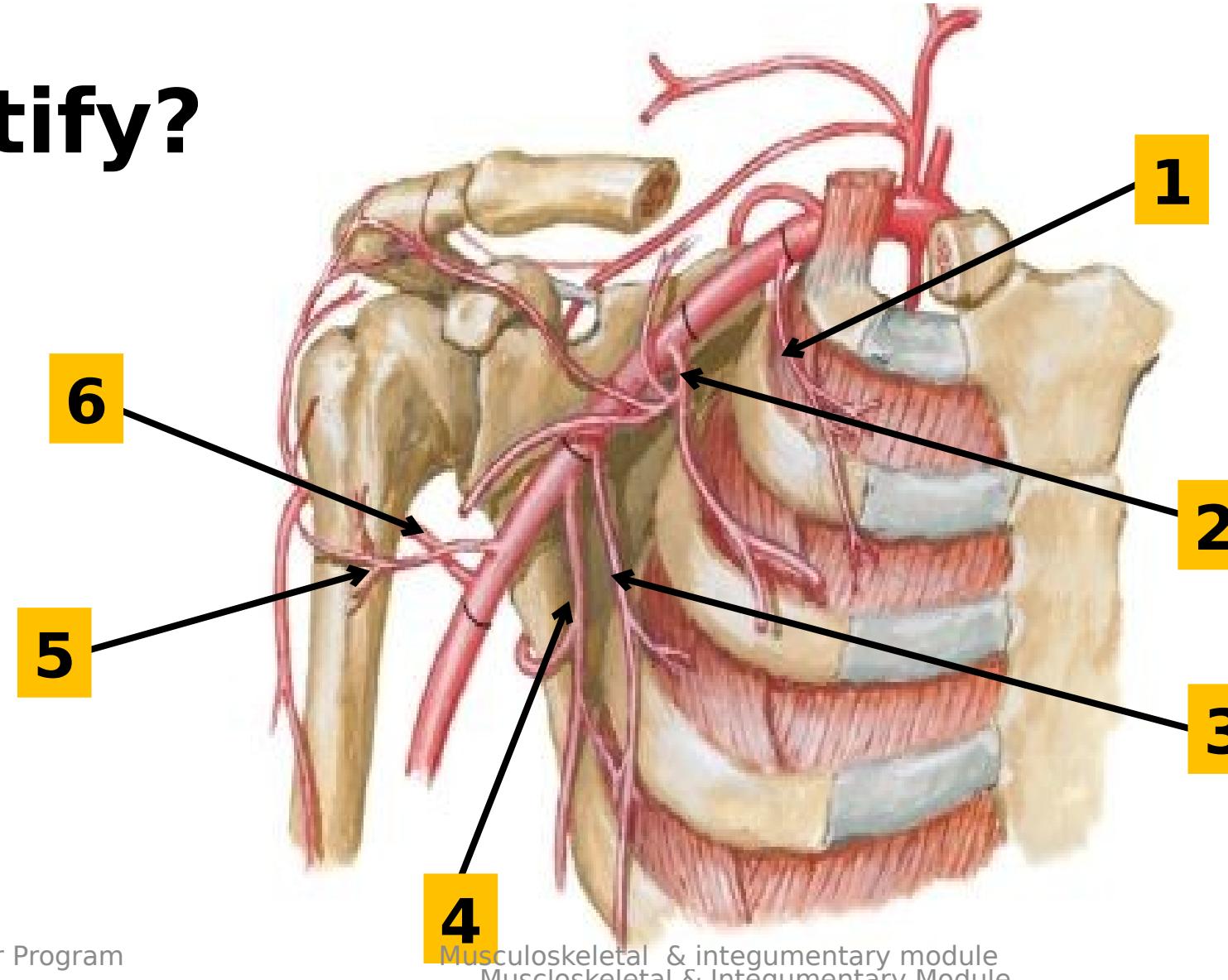


Frank H. Netter, 4<sup>th</sup> edition

# Quiz



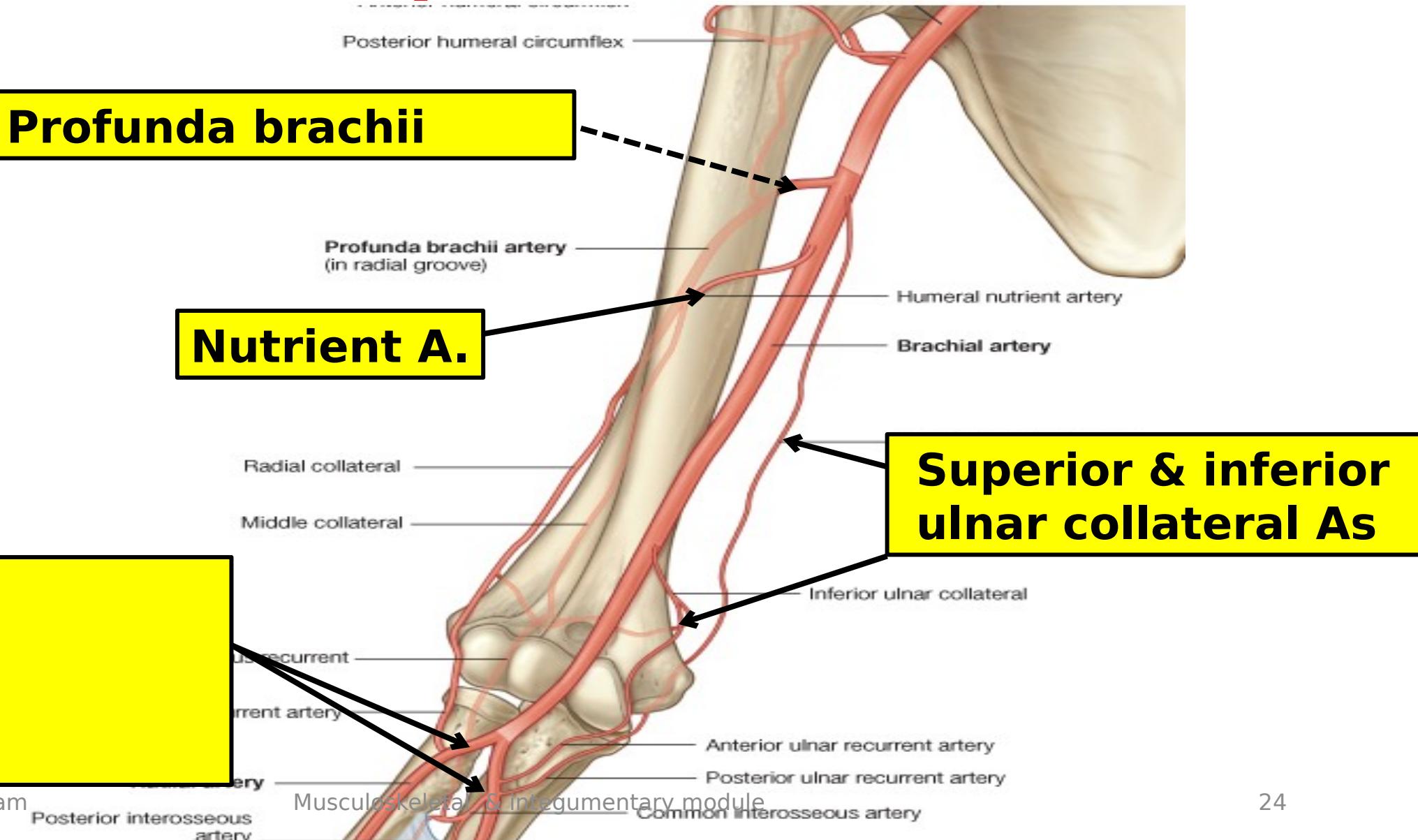
## Identify?



# Brachial artery

## Branches of brachial artery:

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# Radial & Ulnar arteries



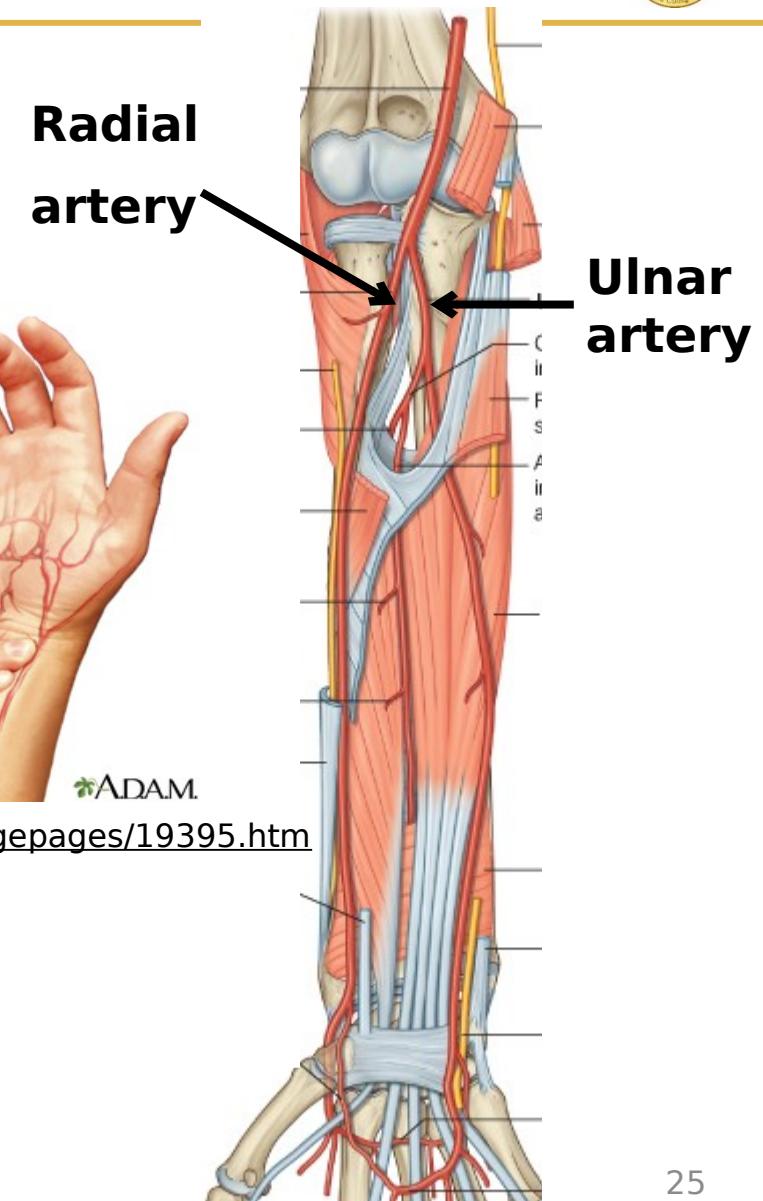
- **Radial & ulnar arteries** are the 2 **terminal branches** of brachial artery, begin at the level of **neck of radius**.

- **Radial artery (smaller)** descend laterally in the forearm to the hand (**radial pulse**).

- **Ulnar artery (larger)** descend medially in the forearm to the hand.



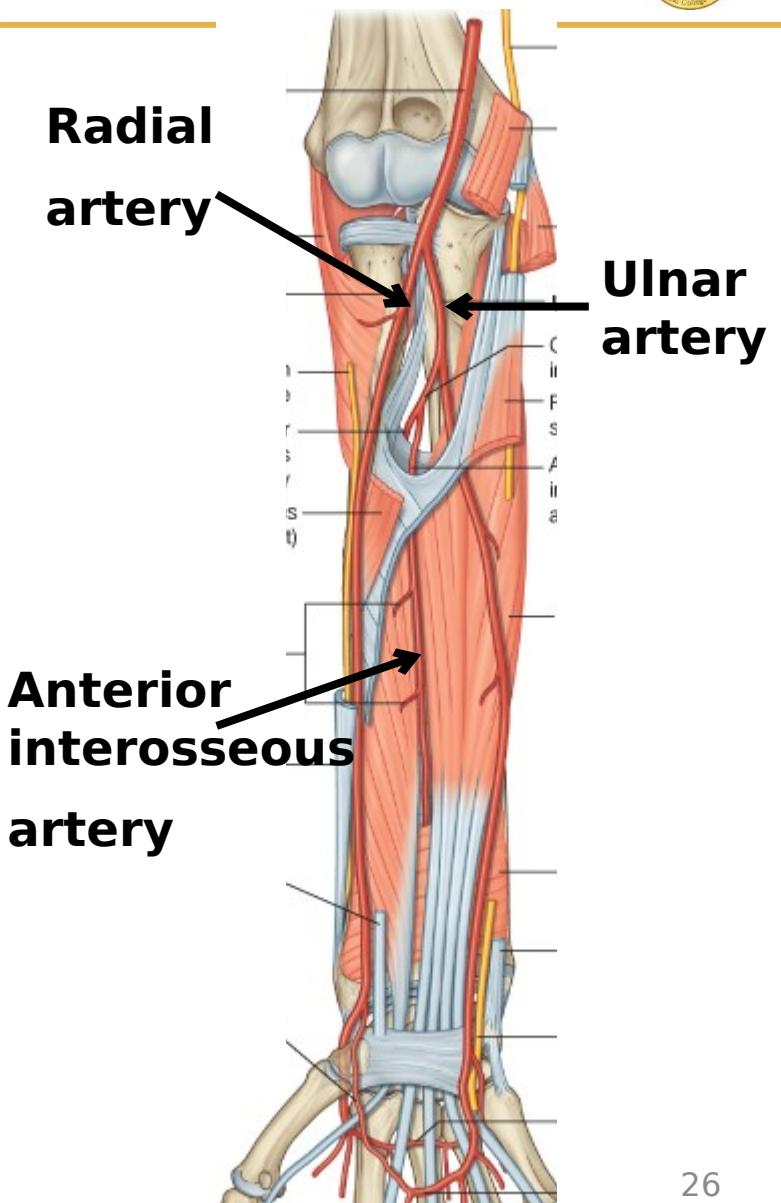
<https://medlineplus.gov/ency/imagepages/19395.htm>



# Radial & Ulnar arteries



- Both of **radial & ulnar arteries** give **recurrent** branches (elbow) & **muscular** branches.
- Both of **radial & ulnar arteries** share to form **carpal & palmar arches** (wrist).
- **Ulnar artery**
- Gives **common interosseous artery** which divides into **anterior** & **posterior interosseous arteries**



# Veins of the Upper Limb



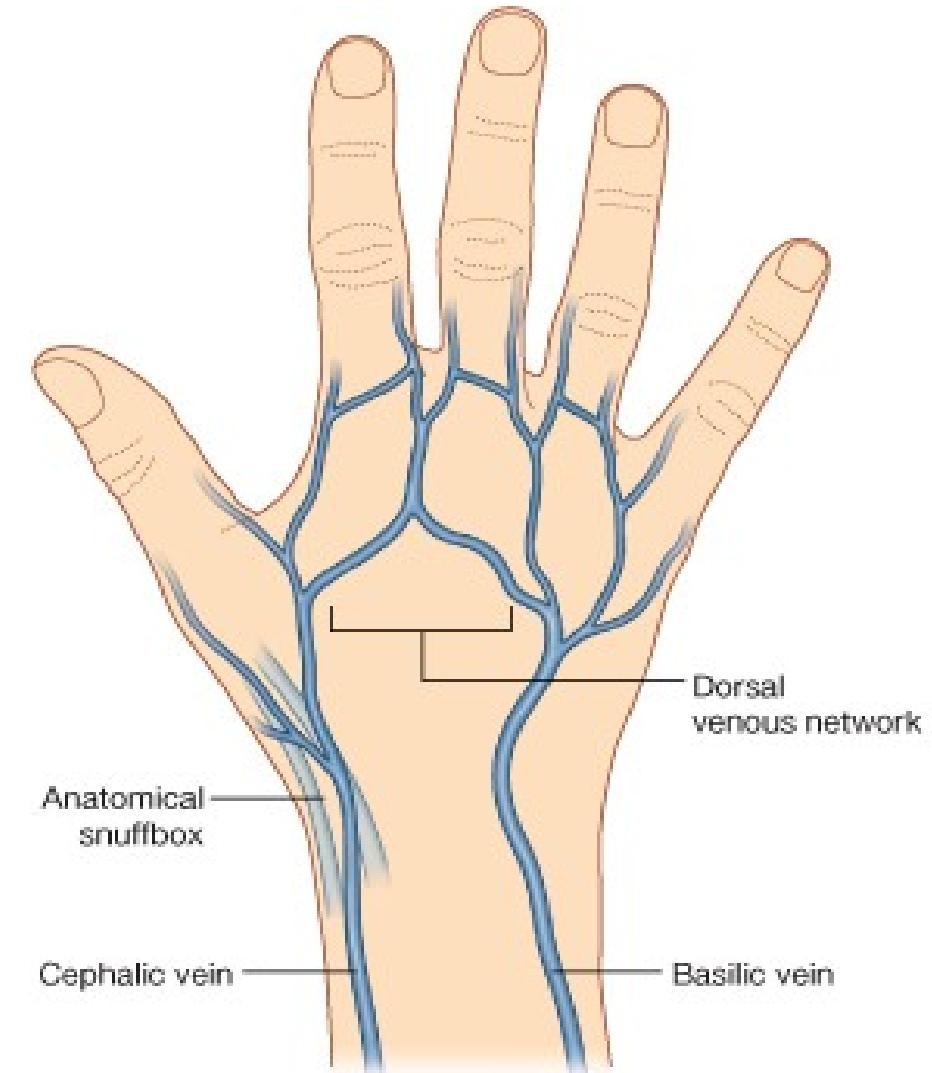
- **Veins of the upper limb include:**

## Deep Veins:

( deep to the deep fascia & usually follow the arteries)

## Superficial Veins:

Begin at the dorsum of the hand by dorsal venous arch which gives **cephalic vein laterally & basilic vein medially.**



# Veins of the Upper Limb

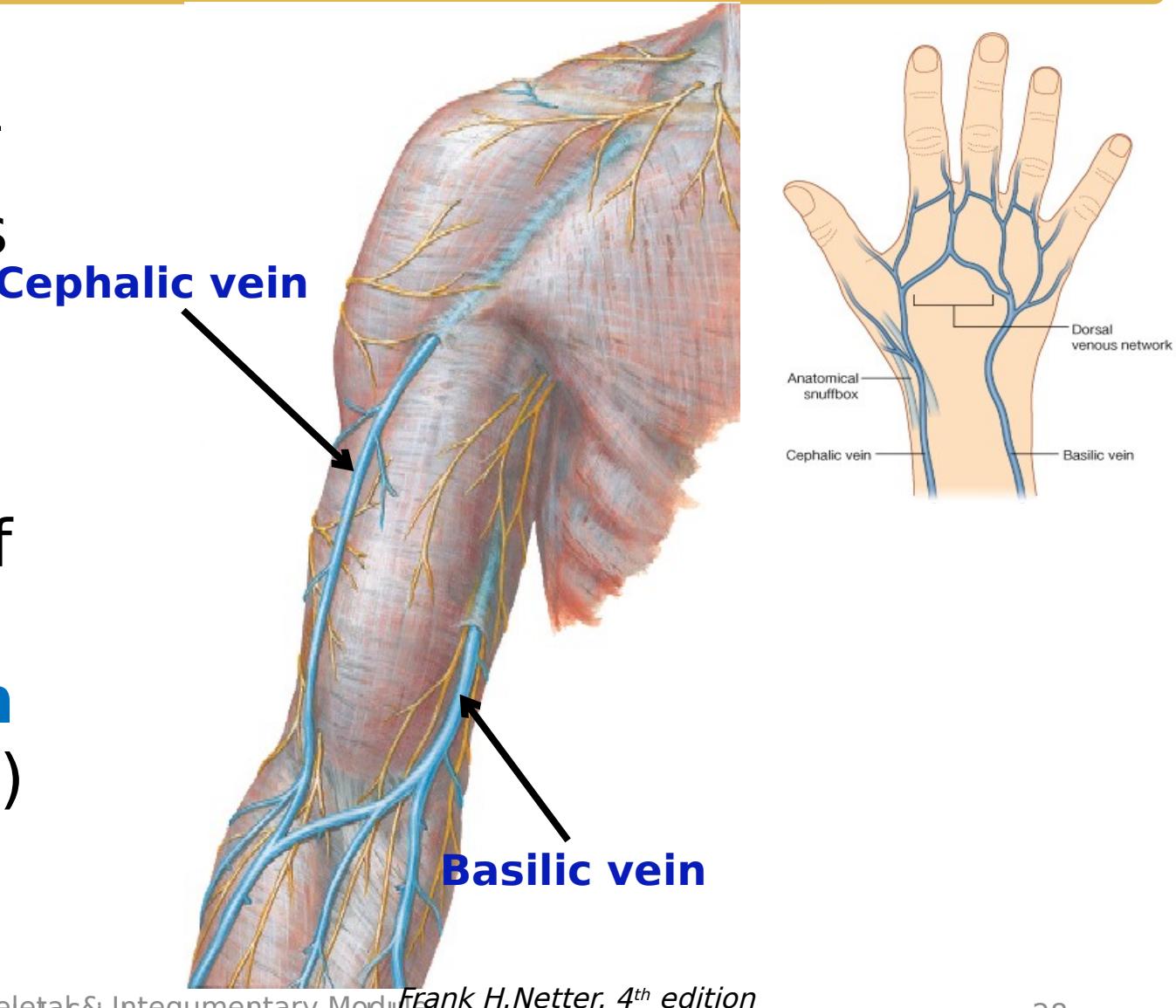


## Cephalic vein:

- **Begins** at the lateral end of dorsal venous arch, ascends in superficial fascia.
- **Drains into** axillary vein

## Basilic vein:

- **Begins** at the medial end of **dorsal venous arch**.
- **Continues** as **axillary vein** (lower border of teres major)



## Lecture Quiz 2 (Nerves & Vessels)



- Brachial artery divided at the level of neck of radius into ..... medially & ..... laterally.
- Dorsal venous arch of the hand gives ..... medially & ..... laterally.

# **SUGGESTED TEXTBOOKS**



1. Frank H. Netter Atlas of Human Anatomy, 4<sup>th</sup> edition.

# Summary



- Names of bones of shoulder girdle, arm, forearm & hand with important general features.
- Different groups of muscles of pectoral region, back, arm, forearm & hand.
- Brachial Plexus.
- Main vessels in the upper limb.



**Thank You**